

## Kirtland's Warbler Annual Census Protocol

**Reporting Office: Seney NWR (Kirtland's Warbler WMA)**

**Species: Kirtland's Warbler (*Setophaga kirtlandii*)-Endangered Species**

### JUSTIFICATION AND OBJECTIVES

The management program for the Endangered Kirtland's Warbler is carried out under the direction of the *Kirtland's Warbler Recovery Team*. One component of the Recovery Plan is to, "monitor breeding populations...in order to evaluate responses to management practices and environmental changes." The singing male census protocol is a critical component of the monitoring program. Overall coordination of this monitoring program has been delegated from the *Recovery Team* to the Wildlife Division, Michigan Department of Natural Resources, with significant involvement by the U.S. Forest Service. Seney NWR is also a cooperator in the monitoring program and usually works on finding singing male warblers in the eastern Upper Peninsula. **Procedures and reporting forms change slightly from year to year and refuge staff should consult with the *Recovery Team* before conducting the survey.**

The Kirtland's Warbler spring census is a tool that enables managers to:

- 1) evaluate the Warbler population relative to the recovery objective (1,000 singing males for five consecutive years);
- 2) determine the presence or absence of individuals in areas for protection purposes;
- 3) evaluate habitat management activities (for example, plantation vs. trench and seed);
- 4) detect differences in occupancy, duration of use, and density of singing males between management areas;
- 5) build public confidence in Endangered species management;
- 6) provide data for research.

Seney NWR has been participating in this survey since ~1989. Data exists for the population of birds at Kirtland's Warbler WMA since 2000.

### STATISTICAL CONSIDERATIONS

The major assumption of the annual census is that the vast majority of the world's populations of Kirtland's Warbler are encountered while intensively (nLP) and extensively (UP, WI) surveying occupied and suspected habitat during the sampling period. It is believed that this work virtually censuses the world's population of this species. A comparison of transect and spot mapping methods for censusing this species is discussed in Probst et al. (2005).

## DATA COLLECTION PROCEDURES

Census procedures make use of the behavior of male Kirtland's Warblers and involve locating and counting territorial males during a ~ 10-day period in June (**dates change by year**):

- a. birds tend to occur in loose assemblages within dense stands of young jack pine between five and 20 ft tall;
- b. males defend their territories with loud and persistent vocalizations. Under good weather conditions, a census participant should easily hear singing males within 1/8 mi;
- c. in good weather, research has suggested that there is a good probability that a territorial male will sing at least once during any 5-minute period between sunrise and 1100h;
- d. Kirtland's Warbler songs are variable and may help distinguish between individuals;
- e. males frequently move significant distances on their territories.

The census consists of traversing appropriate habitat early in the morning and mapping the location of singing male birds. Census counts should be made between local sunrise and 1100h. Local area biologists identify the areas to be worked. Individuals are then recruited to conduct the census in these areas. Some of these individuals will be designated as field surveyors who map and count singing males. Others may conduct field surveys, but are also responsible for coordinating census efforts and reporting results. Good planning and communication is required for a successful census.

The following procedures outline acceptable standards and guidelines for conducting the census in occupied habitat in the northern Lower Peninsula:

- 1) traverse the blocks of habitat in parallel lines using a compass or GPS. These transects should be spaced no more than 1/4 mi apart. Keep track of your location on the line by counting paces or with a GPS;
- 2) census participants in any one area should start and end at the same time. Under most circumstances, a 1-mi transect should be completed within 1.5 hr. The completion time should be agreed upon prior to starting transects;
- 3) stop and listen for singing males every 1/8 mi for one to five minutes. Where possible, listen in an opening or on higher ground. When you hear a bird, note its location on a map. Pay attention to males that may have moved so they are not counted twice;

- 4) triangulate the locations of singing males with your compass to improve the accuracy of the estimated locations on your map. Remember, the census is a conservative estimate— **if in doubt, do not count**;
- 5) record only singing males, and do not count females that may be seen;
- 6) if a Kirtland's Warbler is observed, try to determine if it is banded. If banded, record the color of the bands on each leg. However, it is important to proceed on transect lines in a timely fashion, so only minimal time should be spent trying to determine band combinations;
- 7) wherever possible, complete contiguous blocks of habitat in one morning;
- 8) the census should be completed with as little disturbance to the birds as possible. Do not play recordings of Kirtland's Warbler songs in occupied habitat;
- 9) at the completion of a block of habitat, compare parallel transects and create a master map to be submitted to the census coordinator. The master map should have the date the census was performed, a total count of birds, and the names of the field surveyors. Clearly indicate the location (township, range, section) and section centers on the map;
- 10) the census should not be conducted when there are strong winds or heavy rain;
- 11) in areas of potential habitat where singing males are infrequent or widely distributed (i.e., northwestern Lower Peninsula, Upper Peninsula, Wisconsin, Canada):
  - a. the use of recorded songs in these areas is permissible, but do not play the recordings in known occupied habitat.
  - b. drive roads adjacent to potential habitat, stopping frequently to listen for singing males. Walk into the potential habitat where necessary to ensure that the entire stand is covered. Keep in mind that under good listening conditions warblers can only be heard well 1/8 mi away.
  - c. document females that are sighted on your census map, but distinguish them from the males. Do not actively search for females. When a bird is observed, try to determine if the bird is banded, and record the color of the bands on each leg (upper left, lower left, upper right, lower right).

#### Recommendations and Reminders:

- 1) set declination on your compass (the amount depends on where you are). Practice pacing using a known distance. Review the songs of the Kirtland's Warbler and other species;
- 2) plan census efforts according to the weather. On especially cold mornings, census counts should be delayed until temperatures have begun to rise but should not be

made during afternoons. On warm mornings, the census should be completed by 1000h. Wind or rain reduces the ability to hear singing males. Cold and wet weather reduces the frequency of singing;

- 3) spot check young, old or marginal habitat. Report efforts even if singing males are not found;
- 4) consider the use of handheld radios to facilitate communication for coordinated movement on transects;
- 5) included as an attachment with the census instructions is a guide that will assist you with GPS settings and distance measurements.
- 6) it is beneficial for the same people to census the same areas from year-to-year. It develops a familiarity with area, improves confidence in results, and adds an understanding of habitat change over the years. Share your experience with new census participants.

### **DATA ANALYSIS AND REPORTING**

The master field maps of singing male locations should be finalized immediately after running the census transects (all field forms are provided during pre-survey multi-agency meetings). All field maps should **clearly** indicate the location of the singing males. Make sure the number of bird locations drawn on each map equals the total reported on that map. **All data are reported to the Michigan DNR via an identified Area Leader (established by the Recovery Team).**

### **MANAGEMENT ACTION THRESHOLDS**

The ongoing habitat management program for Kirtland's Warbler is carried out under the direction of the Kirtland's Warbler Recovery Team. Management for Kirtland's Warbler is a cooperative venture of the USFWS, Michigan Department of Natural Resources, U. S. Forest Service, Michigan Department of Military Affairs, and various other private citizens and organizations. Seney NWR (Kirtland's Warbler WMA) plans to move forward with more ecologically-based management, but intensive management for jack pine plantations can still occur if the population falls at or below recovery objective (1,000 singing males).

### **DATA STORAGE PROCEDURES**

The final census results are released only by the authorization of the Recovery Team (usually at the summer meeting) and electronic copies of these data are available upon request from the Michigan DNR, where master files are found. **Georeferenced data on number of birds surveyed on Kirtland's Warbler WMA (point data in a GIS shapefile) can and should be obtained each year by request of the Michigan DNR and/or USFWS East Lansing Field Office and an electronic dbase (Excel) of these data should be kept on file at the Refuge.**

## **SPECIAL CONSIDERATION**

Field crew members:

- 1) must be in good physical condition, be able to walk long distances, and have reasonably good hearing;
- 2) must be able to identify bird songs, especially all Kirtland's Warbler vocalizations and those of other species occurring in young jack pine habitat;
- 3) must be able to navigate with a compass and pacing. The use of a GPS unit is highly recommended;
- 4) must be able to triangulate to estimating bird locations for more accurate mapping and to avoid over-counting.

## **LITERATURE USED**

Mayfield, H.F. 1992. Kirtland's Warbler. In: The Birds of North America, No. 19 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia: The National Academy of Natural Sciences; Washington DC: The American Ornithologists' Union.

Probst, J.R., Donner Wright, D., Bocetti, C.I. and S. Sjogren. 2003. Population increase in Kirtland's Warbler and summer range expansion to Wisconsin and Michigan's Upper Peninsula, USA. *Oryx* 37:1-10.

Probst, J.R., Donner Wright, D., Worland, M., Weinrich, J., Huber, P. and K.R. Ennis. 2005. Comparing census methods for the endangered Kirtland's Warbler. *Journal of Field Ornithology* 76:50-60.

## **EFFORT AND COSTS**

Survey costs differ based upon whether surveys are done in the Upper Peninsula or the Lower Peninsula. In the Upper Peninsula, volunteers assist refuge staff and interns in surveying adjacent, jack pine-dominated lands managed by the Michigan DNR. The amount of land surveyed is directly proportional to amount of time spent and overall cost. Surveys, preparation, and reporting time take approximately 4-6 hrs/day/person and survey effort usually extends for approximately 4-7 days/person (16-42 hrs/person). Some miscellaneous fuel costs are associated with the survey in the Upper Peninsula (approximately \$25/day/vehicle). In the Lower Peninsula, daily surveys costs are higher due to housing and per diem, with considerably more cost in fuel.